

Atmospheric Submillimetre Workshop, 2011

22-23 September 2011

Met Office, Exeter, UK

Title

Submm-Wave Radiometry for Cloud/Humidity/Precipitation Sciences

Dong L. Wu, NASA Goddard Space Flight Center, Code 613.2

Abstract

Although active sensors can provide cloud profiles at good vertical resolution, clouds are often coupled with dynamics to form fast and organized structures. Lack of understanding of these organized systems leads to great challenge for numerical models. The deficiency is partly reflected, for example, in poorly modeled intraseasonal variations (e.g., MJO). Remote sensing clouds in the middle and upper troposphere has been challenging from space. Vis/IR sensors are sensitive to the topmost cloud layers whereas low-frequency MW techniques are sensitivity to liquid and precipitation at the bottom of cloud layers. The middle-level clouds, mostly in the ice phase, require a sensor that has moderate penetration and sensitivity to cloud scattering, in order to measure cloud water content. Sensors at submm wavelengths provide promising sensitivity and coverage with the spatial resolution needed to measure cloud water content floating in the upper air. In addition, submm-wave sensors are able to provide better measurements of upper-tropospheric humidity than traditional microwave instruments.